QUESTION BANK(DSP)

1. Differentiate DTFT and DFT.
2. Differentiate between DIT and DIF algorithm.
3. How many stages are there for 8 point DFT?
4. Define about DFT and IDFT.
5. What is DIT radix –2 FFT?
6. What is radix-2 FFT?
7. How many multiplications and additions are involved in radix-2 FFT?
8. Give any two applications of DFT (or Mention the importance of DFT)
9. Write the properties of linear convolution?
10. What is the drawback in Fourier Transform and how it is overcome?
11. State any two DFT properties.
12. How many multiplication terms are required for doing DFT by expressional method
13. and FFT method?
14. Find the values of WNk
    a. When N=8, k=2 and also for k=3.
15. Compare DIT radix-2 FFT and DIF radix -2 FFT.
16. Draw the radix-2 FFT–DIF butterfly diagram.
17. Draw the radix-2 FFT–DIT butterfly diagram.
18. What is the necessity of sectioned convolution in signal processing?
19. Define Correlation of the sequence.
20. State any two DFT properties.
21. Why impulse invariant transformation is not a one-to-one mapping?
22. State and prove shifting property of DFT.
23. Derive and draw the radix -2 DIT algorithms for FFT of 8 points.
24. Compute the DFT for the sequence {1, 2, 0, 0, 0, 2, 1, 1}. Using radix -2 DIF FFT and radix -2 DIT- FFT algorithm.

25. FIR & IIR Filters

26. Distinguish IIR and FIR filters.

27. Distinguish analog and digital filters.

28. Write the expression for order of Butterworth filter?

29. Write the expression for the order of chebyshev filter?

30. Write the various frequency transformations in analog domain?

31. Write the steps in designing chebyshev filter?

32. Write down the steps for designing a Butterworth filter?

33. State the equation for finding the poles in chebyshev filter.

34. Write the steps involved in FIR filter design.

35. What are advantages of FIR filter?

36. What are the disadvantages of FIR FILTER?

37. What is the necessary and sufficient condition for the linear phase characteristic of a FIR filter?

38. List the well known design technique for linear phase FIR filter design?

39. For what kind of application, the antisymmetrical impulse response can be used?

40. For what kind of application, the symmetrical impulse response can be used?

41. What is the reason that FIR filter is always stable?

42. What condition on the FIR sequence h(n) are to be imposed n order that this filtercan be called a liner phase filter?

43. Under what conditions a finite duration sequence h(n) will yield constant group delay in its frequency response characteristics and not the phase delay?

44. State the condition for a digital filter to be causal and stable?

45. What are the properties of FIR filter?

46. When cascade from realization is preferred in FIR filters?

47. What are the disadvantages of Fourier series method?

48. What are the desirable characteristics of the windows?

49. Compare Hamming window with Kaiser Window.

50. What is the necessary and sufficient condition for linear phase characteristics in FIR filter?

51. Differentiate IIR filters and FIR filters?

52. Write the characteristics features of Hanning window?

53. Define pre-warping effect? Why it is employed?

54. Give any two properties of Butterworth filter.

55. When a FIR filter is said to be a linear phase FIR filter?

56. Write the characteristics features of rectangular window.

57. Write the expression for Kaiser window function.

58. What are the advantages and disadvantages of FIR filters?

59. Write the characteristics features of Hamming window?

60. Why mapping is needed in the design of digital filters?

61. Explain the procedural steps the design of low pass digital Butterworth filter and list its properties.

62. List the three well known methods of design technique for IIR filters and explain any one.

63. Using frequency sampling method, design a band pass FIR filter with the following specification. Sampling frequency Fs =8000 Hz, Cutoff frequency fc1 =1000Hz, fc2 =3000Hz.Determine the filter coefficients for N =7.

64. What condition on the FIR sequence h(n) are to be imposed n order that this filter can be called a linear phase filter?

65. Design a causal linear phase FIR filter with 8 taps and a cut-off frequency of
    a. Π/4 using the frequency sampling method with a rectangular window.

66. (FINITE WORD LENGTH EFFECT)

67. Define white noise?

68. What do you understand by a fixed-point number?

69. What is meant by block floating point representation? What are its advantages?

70. What are the advantages of floating point arithmetic?

71. How the multiplication & addition are carried out in floating point arithmetic?

72. What do you understand by input quantization error?

73. What is the relationship between truncation error e and the bits b for representing a decimal into binary?

74. What is meant rounding? Discuss its effect on all types of number representation?

75. What is meant by A/D conversion noise?

76. What is the effect of quantization on pole location?

77. What is meant by quantization step size?

78. How would you relate the steady-state noise power due to quantization and the b bits representing the binary sequence?

79. What is overflow oscillation?

80. What are the methods used to prevent overflow?

81. What are the two kinds of limit cycle behavior in DSP?

82. Determine "dead band" of the filter.

83. Explain briefly the need for scaling in the digital filter implementation.

84. Explain circular shifting and state its importance in Discrete Fourier Transforms.

85. How to obtain the output sequence of linear convolution through circular convolution? Distinguish between linear convolution and circular convolution of two sequences.

86. What is zero padding? What are its uses?

87. Why FFT is needed? What is meant by radix-2 FFT? Why the computations in FFT algorithm is said to be in place?

88. What are the different types of filters based on impulse response? What are the different types of filters based on frequency response?

89. How one can design digital filters from analog filters? Mention the procedures for digitizing the transfer function of an analog filter.

90. Distinguish between FIR filters and IIR filters.

91. What is bilinear transformation? What are the properties of bilinear transformation? Write a short note on pre-warping.

92. How phase distortion and delay distortion are introduced?

93. What is mean by FIR filter? Write the steps involved in FIR filter design. Give the advantages and disadvantages of FIR filter?

94. Define necessary and sufficient condition for linear phase characteristic of FIR filter?

95. Justify that that FIR filter is always stable?